

AMENDMENTS TO THE DRAWINGS:

The attached sheet of drawings, which includes Fig. 1, replaces the previous drawing sheet including Fig. 1. In Fig. 1, descriptive legend for block 10 has been provided, as well as deleting an unidentified internal block within block 10. In addition, the variables shown in Fig. 1 have been corrected to be consistent with the description provided in the specification. No new matter has been introduced.

Attachment: 1 replacement sheet.

REMARKS

I. Introduction

Claims 11-16 and 18-20 are currently pending in the present application after cancellation of claim 17. Claim 11 has been amended.

Applicants note with appreciation the acknowledgment of the claim for foreign priority and the indication that all certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)). Applicants also note with appreciation the Examiner's consideration of the Information Disclosure Statement which was previously submitted.

II. Drawings

In response to the drawing objection, Applicants have attached a replacement drawing sheet containing corrected Fig. 1 which corrects all of the informalities noted by the Examiner.

III. Rejection of Claims 11-17 under 35 U.S.C. § 112, second paragraph

Claims 11-17 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. In response, Applicants have amended claim 11 to replace "system deviation" with "deviation," which clearly eliminates any potential ambiguity.

IV. Rejection of Claims 11-20 under 35 U.S.C. § 112, first paragraph

Claims 11-20 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement, i.e., the Examiner states that the specification provides no mathematical equations or detailed algorithms for the calculation of target rotation speeds and target torques which would enable one of ordinary skill in the art to make and use the invention as claimed. Applicants respectfully request reconsideration of the rejection in view of the following explanation.

First, the examiner has the burden to establish a reasonable basis to question the enablement. MPEP 2164.04, citing In re Wright, 999 F.2d 1557, 1562 (Fed. Cir. 1993). MPEP 2164.04. In this regard, a “specification disclosure which contains a teaching of the manner and process of making and using an invention **in terms which correspond in scope** to those used in describing and **defining the subject matter** sought to be patented **must be taken as being in compliance with the enablement requirement** of 35 U.S.C. 112, first paragraph, unless there is a reason to doubt the objective truth of the statements contained therein which must be relied on for enabling support.” In re Wands, 858 F.2d 731, 737, 8 U.S.P.Q.2d 1400, 1404 (Fed. Cir. 1988). Applicants note that the claimed limitation “a control system that, based on a coupling condition of the transmission, calculates respective target rotation speeds and target torques for the internal combustion engine, the first electric motor, and the second electric motor” recited in claim 11 (and as similarly recited in claim 18) is described in the present specification (e.g., Substitute Specification, p. 6) using substantially identical words, which means the present specification disclosure should be taken as being in compliance with the enablement requirement.

Second, the “test of enablement is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation.” (MPEP 2164.01, citing In re Wands, 858 F.2d 731, 737 (Fed. Cir. 1988)). In this regard, Applicants respectfully submit that the above-recited test of enablement is met by the present specification, i.e., given the disclosure of the present specification, one of ordinary skill in the art would be able to implement the calculation of the target rotation speeds and target torques based on the coupling condition, without undue experimentation. However, in order to aid the Examiner’s understanding, Applicants will provide below an explanation regarding the determination of the target rotational speeds and target torques on the basis of coupling conditions of the transmission.

In the hybrid drive shown in the figure of the present application, a degree of freedom for the rotational speed exists in hybrid operation. When vehicle speed, and thus rotational speed, $n_{AW \text{ actual}}$ is established at the transmission output shaft, rotational speed $n_{E1 \text{ actual}}$ of first electric motor E1 may be freely selected within the physical limits, for example. Rotational speed $n_{E2 \text{ actual}}$ of second electric motor E2 and rotational speed $n_{VM \text{ actual}}$ of combustion

engine VM are thus derived from the mechanical translations of the transmission, i.e., from the coupling conditions of the transmission (see, e.g., Substitute Spec. p. 2, l. 3-15):

$$\begin{pmatrix} n_{VMactual} \\ n_{E2actual} \end{pmatrix} = \begin{pmatrix} K_1 & K_2 \\ K_3 & K_4 \end{pmatrix} \begin{pmatrix} n_{AWactual} \\ n_{E1actual} \end{pmatrix}$$

Factors K_1 , K_2 , K_3 , and K_4 are determined from the translations, i.e., the numbers of teeth in the transmission and the driving positions engaged in three-shaft manual transmission 4.

From the rotational speed $n_{AW actual}$ at the transmission output shaft, for example, control system 10 establishes setpoint rotational speed $n_{E1 setpoint}$ for first electric motor E1. In this context, input variable 30, which constitutes a position of the gas pedal, and input variable 32, which contains the electric power required by a vehicle electrical system of the motor vehicle, are taken into account. The physical limits of the entire hybrid drive are also taken into account.

Control system 10 uses rotational speed $n_{AW actual}$ at the transmission output shaft and the established setpoint rotational speed $n_{E1 setpoint}$ for first electric motor E1 to determine setpoint rotational speed $n_{E2 setpoint}$ for second electric motor E2 and setpoint rotational speed $n_{VM setpoint}$ for combustion engine VM, taking into account the mechanical translations of the transmission (coupling conditions of the transmission; see, e.g., p. 6, l. 1-11):

$$\begin{pmatrix} n_{VMsetpoint} \\ n_{E2setpoint} \end{pmatrix} = \begin{pmatrix} K_1 & K_2 \\ K_3 & K_4 \end{pmatrix} \begin{pmatrix} n_{AWactual} \\ n_{E1setpoint} \end{pmatrix}$$

An analogous procedure is selected for the setpoint torques. Using input variable 30, which constitutes a position of the gas pedal, and input variable 32, which contains the electric power required by a vehicle electrical system of the motor vehicle, and the physical limits, control system 10 determines a setpoint torque $M_{AW setpoint}$ at the transmission output shaft.

In hybrid operation, a degree of freedom exists in relation to the torques as well. Taking into account input variables 30 and 32, control system 10 establishes setpoint torque

$M_{E1 \text{ setpoint}}$ of first electric motor E1 within the physical limits, for example. The physical limits of the entire hybrid drive are taken into account.

Control system 10 uses setpoint torque $M_{AW \text{ setpoint}}$ at the transmission output shaft and specified setpoint torque $M_{E1 \text{ setpoint}}$ of first electric motor E1 to determine setpoint torque $M_{E2 \text{ setpoint}}$ for second electric motor E2, and setpoint torque $M_{VM \text{ setpoint}}$ for combustion engine VM, taking into account the mechanical translations of the transmission (coupling conditions of the transmission):

$$\begin{pmatrix} n_{VM \text{ setpoint}} \\ n_{E2 \text{ setpoint}} \end{pmatrix} = \begin{pmatrix} \overline{K_1} & \overline{K_2} \\ \overline{K_3} & \overline{K_4} \end{pmatrix} \begin{pmatrix} M_{AW \text{ setpoint}} \\ M_{E1 \text{ setpoint}} \end{pmatrix}$$


Factors $\overline{K_1}$, $\overline{K_2}$, $\overline{K_3}$ and $\overline{K_4}$ are determined from the translations, i.e., the numbers of teeth in the transmission and the driving positions engaged in three-shaft manual transmission 4. The effects of the mass inertias during dynamic operation, and torque losses may be taken into account as well when determining the setpoint torques.

In view of the foregoing explanation, Applicants respectfully request withdrawal of the non-enablement rejection of claims 11-20.

V. CONCLUSION

In view of all of the above, it is respectfully submitted that all of the presently pending claims are in allowable condition. Prompt reconsideration and allowance of the application are respectfully requested.

Respectfully submitted,
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